Self-Healing Corrosion Resistant Coatings

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According to the U.S. Federal Highway Administration, the annual cost of corrosion in the United States is estimated at $276 billion. The most common way to protect materials from corrosion is with coatings, including organic (paint), ceramic and metallic coatings. During use, micro-cracks form in coatings resulting in exposure to the environment, which can lead to catastrophic failure of critical components. Our group is developing low-cost self-healing technology to significantly extend the service life of coatings and the components they protect. Potential healing agents were evaluated and an air-drying triglyceride (linseed oil) was identified as the candidate healing agent. Self-healing coatings are fabricated using urea-formaldehyde encapsulated linseed oil and are evaluated for mechanical performance, corrosion resistance, and self-healing performance. Research into optimization and long term durability and performance of low-cost self-healing coating materials is ongoing.